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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,980	12/03/2001	Aleksandar Damnjanovic	4740-022	2730

24112 7590 02/08/2005

COATS & BENNETT, PLLC
P O BOX 5
RALEIGH, NC 27602

EXAMINER	
D AGOSTA, STEPHEN M	

ART UNIT	PAPER NUMBER
2683	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/005,980	DAMNJANOVIC, ALEKSANDAR	
	Examiner	Art Unit	
	Stephen M. D'Agosta	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-21,23-30,32-43 and 45-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-21,23-30,32-43 and 45-55* is/are allowed.

6)☒ Claim(s) *1 and 4-10 and 12-14* is/are rejected.

7)☒ Claim(s) *2 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-2 and 4-14 have been considered but are moot in view of the new ground(s) of rejection.

1. The applicant has amended all claims per the examiner's recommendation except claim 1. Claims 2 and 3 were objected to and both needed to be added to claim 1 for it to be allowed. This was not the case since only claim 3 was added. A new rejection is shown below addressing this new claim. The examiner traded messages with the applicant regarding the amendment but does not agree that claim 1 is allowable as written.

2. Claims 15-21, 23-30, 32-43 and 45-55 **allowed.**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4-10 and 12-14 rejected under 35 U.S.C. 102(e) as being anticipated by Fawaz et al. US 6,654,374 (hereafter Fawaz).

As per **claim 1**, Fawaz teaches a method of scheduling a plurality of users (C4, L23-29 teaches communications between two nodes) sharing use of an air interface in a wireless communications network (C1, L35-38 and C6, L35-42), the method comprising:

Calculating a scheduling metric for each user (C7, L61 to C8, L7 teaches use of QoS which in effect schedules when data is to be sent for each user), said scheduling metric being dependent on a minimum data rate defined for the user (abstract and C7, L2-5 teach minimum data rate); and

Defining the scheduling metrics such that a magnitude of the scheduling metric for each user depends on a differential value between an average served data rate of the user and the minimum data rate defined for the user, wherein users having smaller differential values are preferentially scheduled (C11, L12-33 teaches QoS congestion management whereby data rates can be reduced if/when congested. Conversely, the data rate can be increased to a higher rate if/when links are not congested and a user has data to send (C11, L7-12). The abstract teaches "scheduler ensures packets are transmitted at the minimum defined data rate" which allows for the data rate for a first user to be increased and thus gives preferential treatment over a second user who's data rate was not increased since said first user takes more bandwidth and minimizes delays that would affect the user's SLA and QoS). Also, the Abstact teaches use of SLA's and C3, L55-59 teaches QoS – hence, one skilled realizes that a user with a high/great QoS need, eg. greatest scheduling metric, will require the most bandwidth and is usually selected first in order for the system to support their need for the bandwidth. The SLA will dictate the order in which users gain access to the bandwidth. Furthermore, C7, L39-45 teaches "classification information" which can be added to a packet's SLA data and would be used to define the user's class, similar to ATM Class of Service, as disclosed by Fawaz, C7, L50-52 and the abstract teaches "scheduler, fig. 6, #316, ensures packets are transmitted at the minimum defined data rate"). Since a "metric calculator is used to calculate a scheduling metric for each user, wherein said scheduling metric is calculated based on a minimum data rate defined for the user" (C7, L61 to C8, L7 which teaches use of QoS which in effect schedules when data is to be sent for each user AND abstract and C7, L2-5 teach minimum data rate AND A comparator to compare the scheduling metrics to identify the user having the most favorable scheduling metric, such that the identified user is scheduled for service via the air interface (C6, L3-10 teaches use of packet scheduling as does C10, L56-59.

Fawaz's teaching of QoS inherently requires the system to compare and then adapt the network access ***to be as favorable as possible to each user's SLA needs – which reads on the claim***).

Scheduling users based on the scheduling metrics (C6, L3-10 teaches use of packet scheduling as does C10, L56-59).

As per **claim 4**, Fawaz teaches claim 1 wherein calculating a scheduling metric for each user comprises calculating metrics for the plurality of users at a scheduling decision point (abstract teaches setting a Service Level Agreement, SLA, for the communications between two end-points which is when the decision is made as to how the system will support the data transmission via the QoS – whereby packets are passed to the scheduler for transmission).

As per **claim 5**, Fawaz teaches claim 4 wherein scheduling users based on the scheduling metrics comprises selecting the user having the greatest scheduling metric for a defined interval of service via the air interface (Abstact teaches use of SLA's and C3, L55-59 teaches QoS – hence, one skilled realizes that a user with a high/great QoS need, eg. greatest scheduling metric, will require the most bandwidth and is usually selected first in order for the system to support their need for the bandwidth. Also, the SLA will dictate the order in which users gain access to the bandwidth).

As per **claim 6**, Fawaz teaches claim 5 further comprising defining the scheduling metrics such that the magnitudes of the scheduling metrics vary proportionately with the minimum data rates defined for the users, so that scheduling is preferentially biased towards users having higher defined minimum data rates (Abstact teaches use of SLA's and C3, L55-59 teaches QoS – hence, one skilled realizes that a user with a high/great QoS need, eg. greatest scheduling metric, will require the most bandwidth and is usually selected first in order for the system to support their need for the bandwidth. Also, the SLA will dictate the order in which users gain access to the bandwidth).

As per **claim 7**, Fawaz teaches claim 1 further comprising defining a minimum data rate for each user based upon a user class of each user, and wherein different user classes have different minimum data rates such that scheduling is biased by user class (Abstact teaches use of SLA's and C3, L55-59 teaches QoS – hence, one skilled realizes SLA's and QoS inherently define user classes with varying degrees of importance and thus reads on the claim).

As per **claim 8**, Fawaz teaches claim 1 further comprising:

Defining a common minimum data rate for the plurality of users (C7, L2-5 teaches a connection between users that would be a common data rate to support an average number of users who would communicate at once) : and

Including a user variable in the scheduling metric of each user such that scheduling of the plurality of users is biased by the user class variables (C7, L39-45 teaches "classification information" which can be added to a packet's SLA data and would be used to define the user's class, similar to ATM Class of Service, as disclosed by Fawaz, C7, L50-52).

As per **claim 9**, Fawaz teaches claim 8 further comprising setting a value of the user variable for each user based on a user class with the user, wherein different user classes have different user variable values such that scheduling is biased by user class (Abstact teaches use of SLA's and C3, L55-59 teaches QoS – hence, one skilled realizes SLA's and QoS inherently define user classes with varying degrees of importance and thus reads on the claim).

As per **claim 10**, Fawaz teaches claim 1 wherein calculating the scheduling metric for each user comprises differentiating a utility function that depends on the minimum data rate defined for the user (Fawaz teaches "classification information" which can be added to the packet being transferred to, for example, to determine the type of application used (C7, L39-45), and thus reads on "utility". One skilled would ensure that the classification/utility matches the type of data being transported, eg. voice is real-time and requires one minimum data rate and QoS, which email is not real-time and would require a different MDR and QoS).

As per **claim 12**, Fawaz teaches claim 1 further comprising defining the scheduling metric for each user to depend upon a QoS delay constraint associated with the user in addition to the MDR defined for the user, wherein the QoS delay constraint defines a maximum delay for pending data to be delivered to the user via the air interface (C11, L12-33 teaches QoS congestion management whereby data rates can be reduced if/when congested and queue delays are exceeded. Conversely, the data rate can be increased to a higher rate if/when links are not congested and a user has data to send (C11, L7-12). The abstract teaches "scheduler ensures packets are transmitted at the minimum defined data rate" so as to minimize delays that would affect the user's SLA and QoS and delay data transmissions).

As per **claim 13**, Fawaz teaches claim 12 further comprising dynamically updating the QoS delay constraint for each user based on whether the QoS delay is violated (C11, L12-33 teaches QoS congestion management whereby data rates can be reduced if/when congested and queue delays are exceeded. This requires either lowering data rates or re-routing packets via other non-congested routes).

As per **claim 14**, Fawaz teaches claim 12 wherein dynamically updating the QoS delay constraint increases the scheduling preferences of the user if the QoS delay constraint is violated, and decreases the scheduling preference of the user if the QoS delay constraint is not violated (C11, L12-33 teaches QoS congestion management whereby data rates can be reduced if/when congested and queue delays are exceeded. This requires either lowering data rates or re-routing packets via other non-congested routes. Also, if/when the constraint is violated, QoS preference is given to the user's in the queue as per a FIFO queue. Hence, one skilled would ensure the congestion management system monitors the congestion rate and adapts the user's access to transmission bandwidth accordingly).

Allowable Subject Matter

1. **Claims 15-21, 23-30, 32-43 and 45-55** allowed.

2. **Claims 2 and 11** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. *These claims recite novel features in the examiner's opinion.*

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen D'Agosta
1-24-05

WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600